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ABSTRACT

This discussion of the use of information technology in adult education is divided into two main parts. The first asks the audience to think about ways in which adult education is being called upon to respond to the information technology revolution, and the second invites the audience to consider what adult educators should be doing up to the year 2000. Because views differ so significantly on this issue, the views are deliberately polarized into those of the optimists and those of the pessimists. The following topics are discussed: (1) teaching about the nature of information technology; (2) teaching adults to use information technology; (3) teaching scholastic and vocational subjects with the help of information technology; (4) optimists' views on future uses of information technology in adult education; (5) pessimists' views on problems involved in introducing information technology into adult education; and (6) the author's personal views on the future of information technology in adult education. (THC)

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INFORMATION TECHNOLOGY AND EDUCATING ADULTS

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Introduction

I am very pleased indeed, for several reasons, to have this opportunity of addressing you. I am glad because in all the 15 years I have been at the Open University this is the first time I have talked to the European Bureau of Adult Education. Then, I am always pleased to be invited to speak at Maryland, this handsome college. I know I am among people who care about education. You have also asked me to speak about information technology in education, a subject that interests me very greatly, so greatly that I have written two books about it.

What I want to say to you this evening is in two main parts. I shall begin by asking you to think about the ways in which adult education is being called upon to respond to the information technology revolution. Many of the papers in this excellent edition of your Newsletter are on the same topic, so I shall be summarising. Second, I invite you to consider what adult educators should be doing up to the year 2000. Views differ, therefore I shall deliberately polarise them into the optimists' and the pessimists', before offering you my own opinion. That, I hope, will lead us into a useful discussion and set the scene for the rest of your conference.

Teaching about the Nature of IT

IT is now an important part of national life. I do not need to tell you how IT is being used by factories, farms, fashion houses, fire brigades, fisheries, flying schools, foodshops, football teams and fuel

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companies, just to mention a few. There is therefore a good reason for educating adults, as well as children, about the nature of IT.

IT is based largely on telecommunications and computers, and computers are made up of hardware, which you could say is 'all you can touch' about them, and software, which consists of the programs of commands that control the hardware. The hardware is mostly microelectronic, therefore adults who want to understand its nature must learn something about microelectronics. I have only an elementary understanding of this subject myself, but I find it very valuable because I can explain, sufficiently well, how the hardware works.

But knowing about hardware does not help much unless you also understand a little about the software. At the very least, adults should learn about the main levels of computer language in which programs are written, and some of them may find it interesting to go on to do some programming themselves in a language such as BASIC. Programming is a rather boring occupation for most people, therefore every adult learning about computers should not expect to be an expert programmer. That is quite unnecessary, and would be extremely expensive to arrange, even if it were desirable. Many people can learn elementary programming, but few become really good at it.

Teaching Adults to Use IT

Let us assume that adults in our classes now have a foundation of some understanding of the nature of IT. Probably they will be very interested by now in learning how to use it. In fact, it is possible to change the order, and teach them this first: up to a point, they can learn how to use IT long before they understand the nature of IT itself.

One of the simplest uses of IT is for word-processing. To compute means, in English, to 'reckon in numbers', therefore it is perhaps

surprising to think that working with words should be for many adults their first introduction to computers, as it was mine. But I advocate word-processing as a start because so many of us deal in words, especially if we are in education. Word-processing offers us a way to deal better in words, to do better something we are already accustomed to doing. Word-processing programs are very 'user-friendly' and they forgive the mistakes of those like me who have never been trained to type properly. Word-processing produces final typescript that we can be proud of.

(Introduce Epson.)

Let me mention some other important uses of IT: for stock-taking and business accounts. You may have seen a member of staff in a supermarket keying the orders of the day into a small device, which is then connected by telephone to the main computer. Or you may have used a financial program, with plenty of helpful advice built into it. Adults like to learn how to use IT because of the practical advantages it offers to businesses.

These are fairly simple applications of IT. Beyond them lie others that are more technical and more difficult to master, but extremely valuable in vocational terms. I shall mention a few examples.

By using a computer with a 'spreadsheet' program, without very much training, you can set up a complicated table of figures in one part of the spreadsheet. In another part, you enter the formula for the calculations you wish to perform with each cell of the table. Then you can cause the results of these calculations to appear, almost instantaneously, in a third part of the sheet. Clearly, this is very useful if your work involves a good deal of statistical calculation.

Or, by using computer-aided design equipment, you can learn to draft high-quality engineering drawings with the help of a computer.

Or, by using a computer and suitable software, you can schedule complex operations, such as everything involved in the erection of a large building.

In each of these examples, adults are learning to use the IT and its software as an important tool to assist them in carrying out activities quickly and efficiently. In some cases, the technology may enable them to do what they cannot otherwise do. At the simplest level, adults who cannot add find themselves adding, those who cannot spell produce words correctly spelled, and those whose handwriting is difficult to read, perhaps because of a physical disability, produce typescript that is easily read. IT can help people who have difficulty in learning. They can check inventories, keep track of stocks, even avoid going into debt, and so on. Up to a point, IT offers valuable tools for adults to learn how to use.

Scholastic and Vocational Subjects with the Help of IT

Scholastic and vocational subjects can be learned with the help of IT. For example, computer-assisted learning offers four types of programs: drill-and-practice, games, tutorials and simulations.

Drill-and-practice programs are commonplace. They incorporate the old linear programmed learning techniques of the 1960s and offer adults plenty of boring practice in fields such as solving problems in arithmetic or physics, or in using phrases in language teaching.

Games can be educational or trivial, whether or not they are entertaining. Some of the best educational software incorporates the uncertainty and competition built into many games, and adults usually enjoy these programs and can learn from them.

Tutorials can be programmed, but they usually suffer from the same disadvantages as the old branching programs. For example, the computer may give the student a diagnostic test to find out where he or she needs

help and then may suggest a learning routine. But designing the test and the routine so that they meet the needs of most students is very difficult. The computer may require the student to do unsuitable work, and may misinterpret his or her problems.

Simulations, although quite expensive to program, offer most benefit to adult learners. For example, many skills, such as driving a car or flying, can be partially taught through a computer simulation. Dangerous situations, as in a chemical plant, can be simulated safely for training purposes. Complex problems in economics or biology can be simulated: competing factors can be weighed against each other and the effects observed on the screen, thus increasing understanding. Many of these simulations are only possible with the help of a computer. A game element can be introduced if you think it will improve learning.

Other forms of IT can used similarly. For example, the airwaves or the telephone lines can carry teaching text, accessible in this country as Ceefax and Oracle (teletext) and Prestel (videotext). Interactive videotext is now feasible. Interactive videotape and videodisc systems are already in use for teaching adults, and more are coming.

At the OU this week you will see some actual systems instead of sitting here listening to me talking about them. There are also books on the subject, and here is a short reading list.

To 2000 AD

So far in what I have said, I have been rather positive. I have been stressing the positive aspects of IT and what adults can do with it. You may even feel I have been selling IT. But I am sure you are aware of some of the political, social, educational, technical and financial problems of introducing IT into the education of adults. The challenge before us is to solve these problems. The question is, by the

year 2000 AD, will adult educators be making full use of IT?

Optimists' views

The optimists claim that IT will greatly widen educational opportunity. That it will break the limits of time and space, of schedule and geography, to give all adult learners the chances they want.

IT, they say, is going to open up the information stores of the world to all people. If literacy flung wide the gates of the storehouses of knowledge, IT will do so a hundred times more effectively.

Of course, people faced with large stores of information need to be selective: they cannot possible attend to everything. IT helps us to select what we want, through giving us fast searching that can look through hundreds of thousands of items in a few minutes.

Even more important, IT gives adults the means of processing information. It puts them in command of this processing. By 2000, every home will have a powerful eletronic workstation, suitable for processing and even creating information. Information creators, many of them working from the comfort of their own homes, will be able to add to those great knowledge stores, the databases. Just as adults will pay something to obtain information, so too they will be paid for information they create. The information market will be a hectic and thriving one, with fortunes to be made.

Adult education will share in this bonanza, of course, because over the next 15 years adults will make up a large proportion of the population in our respective countries, and will want to be taught how to use the IT, how to join in. The drive towards 'chips with everything' will be so strong that governments will be obliged to finance adult education appropriately. Large quantities of hardware and

software will be provided.

Anyone who opposes this tidal wave will surely be swept away.

Pessimists' views

Rubbish, say the pessimists. The age of IT will not come in adult education, nor should it. When money is short, as it is bound to be in Europe in the years to 2000, shrinking budgets should be used for better purposes than buying hardware and software that become obsolete in five years or less. There are other priorities, like paying human teachers a decent salary, and buying textbooks. IT is just an educational bandwagon, like television or programmed learning. We shall be here, teaching away, long after it has passed by.

Even if the cash were available, they say, suitable software is not. It is well-known that most educational software is primitive, not worth buying. There will have to be considerable capital investment in software development, and where is the money coming from for that?

Even supposing hardware and software both become available, where are the trained adult educators? In 15 years' time, at least 40% of the teachers will be the same ones we have today, and very few of them have the training, still less the time and inclination to become trained in this new field.

IT, say the pessimists, is controlled by big money. International conglomerates. National governments are having difficulty in controlling these companies. Neither companies nor governments are sympathetic to adult education.

IT is going to land up in the hands of elites, who will control access to information, because information is power. Information will be bought and sold, yes, but the only people to benefit will be those who have power and money. IT is essentially unjust in its effects,

increasing the gap between the rich and the poor.

Every home will NOT have an electronic workstation by 2000, because only the middle-class will be able to afford one. And many middle-class people will be pushed by market forces into buying something they cannot really afford and do not really need. Those who do buy will find that their purchases are technically incompatible with what the Jones have next door.

As for word-processing and the like, what is wrong with paper and ink? Where will the mad pursuit of greater and faster processing power lead us? Who needs to do things faster, anyway? The whole IT revolution is a confidence trick, based on a technology developed for the military and which the human race can do without.

My own views

Yes, I am convinced that IT in our countries is powered by political, economic and technological forces that will not fade. IT is already in the hands of powerful interests. It will influence deeply the lives of many people by the year 2000. The only way to avoid gross exploitation is by education of the rest of us so that we understand what IT is and what it can do.

Yes, I can understand the ambivalence that many of my friends have towards IT. I have some of it myself. Technology has brought us to the brink of nuclear oblivion. Life without modern technology seems to me to have been less hurried, less stressed. The life of the spirit seems to be separated by a great gulf from the life of the machine. I am sure that IT is capable of harming us as well as helping us. All the more reason for understanding it and using it for benevolent purposes.

Yet education, including adult education, has been insulated from much technological change in this century. Can it remain insulated from IT? I do not think so, and nor should it. Here is a new technology

with great potential for adult education. We must use IT to extend our senses, to increase our understanding of our world, and to stimulate our creative imagination.

Can adult education take advantage of IT? I hope so, but that depends on us. I wish you well in your deliberations this week.

Prepared for the Annual Conference of the European Bureau of Adult Education, Woburn, England, September, 1985.